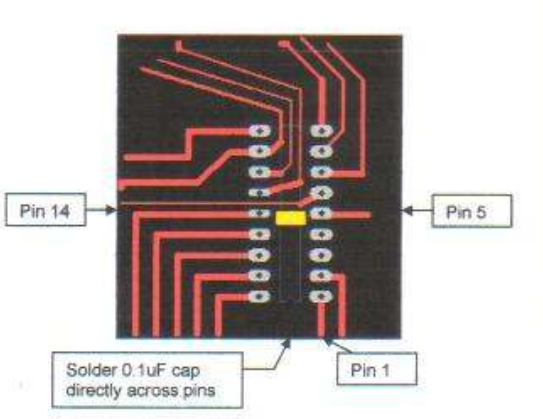
SRCC DDS Signal Generator project – Improvements and Modifications by John, G8MNY [edited by Steve, G4FYF]

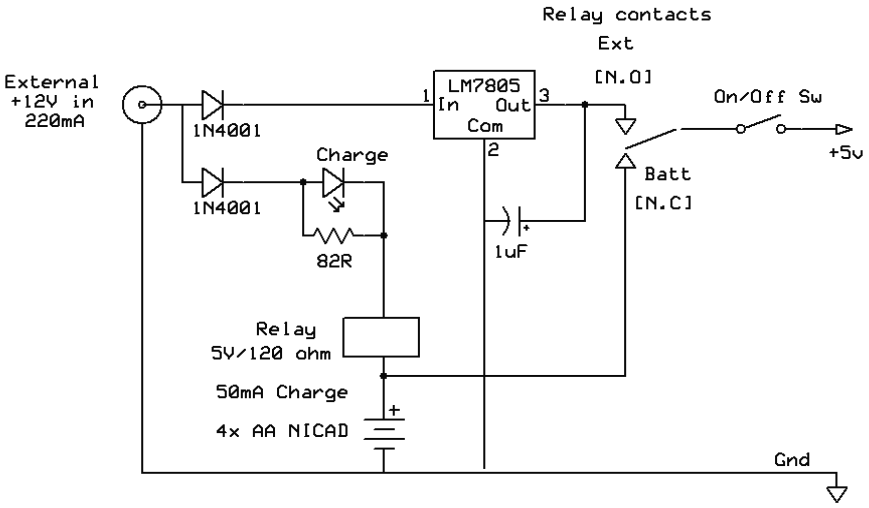
1) PIC 'noise' reduction

The output signal of the DDS when examined on a spectrum analyser showed regular, discernable spikes of 'noise' across the RF spectrum. These were generated by the PIC processing functions. Placing a 0.1uF capacitor *directly* across the PIC +5V and Gnd supplies dramatically suppressed erroneous RF generation. This is achieved by soldering the capacitor between pins 5 and 14 on the *underside* of the PCB. Note that capacitor should be soldered with leads as short as possible to ensure effectiveness throughout the range of the DDS. Ideally, use a 'leadless' capacitor.



2) Powering

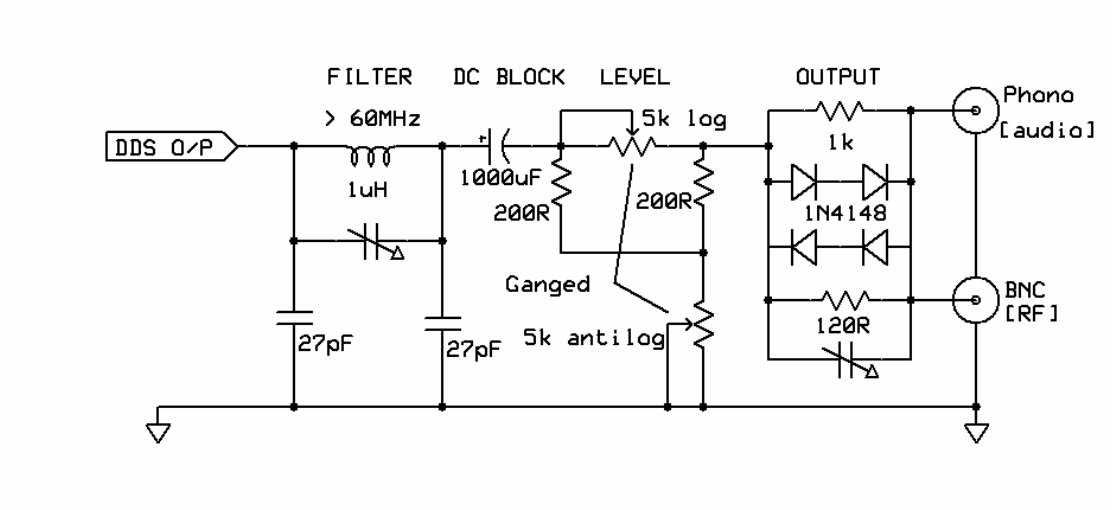
I incorporated a nicad battery option that operates in conjunction with an external 12V supply allowing internal or remote powering.



With no external supply, DDS is powered by wired-in nicads. Applying external 12V energises the relay and 5V is delivered via the voltage regulator. At the same time, current then flows through the LED and relay coil resulting 150mA or so to charge the nicads.

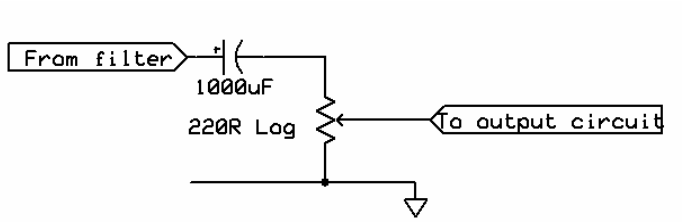
3) DDS output modification

After experimentation I found that replacing the 4.7pF capacitor of the output filter with a 27pF and adding a trimmer capacitor across the choke adjusts the filter profile with improved filter performance, especially above 60MHz.



I had to hand a 5k log/antilog pot that I included as an adjustable attenuator whilst maintaining a reasonably constant output resistance to the filter. A phono connector was added for application at audio frequencies. It has been noted that the DDS output falls steadily above about 30MHz. The R/C combination in series with the RF output BNC flattens this effect to some extent (trimmers are 20pF).

An alternative is to simply use a 220 Ω log pot in place of the log/antilog arrangement.



Finally, to offer some RF protection to the DDS and PIC, protection diodes are added to the output circuit should you accidentally transmit into it!!